



**The Morgan State University
High Performance Computing Summer
Institute:**

**Foundation of Faculty/Student
Technological and Scientific Investigations**

Presented by

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Eighth Annual MU-SPIN Conference

Albuquerque, New Mexico

October 20-22, 1998



Introduction

- **The High Performance Computer Summer Institute (HPCSI) was initiated in 1994 as a program component of the WBHR Alliance for Minority Participation (AMP)**
- **Purpose of this AMP component was to enable undergraduates to participate in a wide range of research activities centered on the use of advanced computing technologies**
- **Jointly funded by the NSF and NASA**



Goals of the HPCSI

- **Enhance the computing skills and expertise of the undergraduate (ug) SEM students**
- **Promote the use of advanced computing technologies in the ug educational experience, research and in the classroom**
- **Develop graduates who will enter the workforce capable of applying advanced computing technologies to challenging problems**
- **Develop SEM graduates who are uniquely equipped to pursue advanced degrees**



HPCSI Program Description

- **Eight weeks in length - residential**
- **Consists of two major components:**
 - **intensive training in computational techniques**
 - **research promotion through a carefully selected set of projects that span several disciplines**
- **Includes weekly seminars and professional development training**
- **Culminates in a SEM undergraduate research symposium**



Value of the HPCSI

- **Broadens the education of the participants**
- **Grants students an opportunity to engage in computing on a variety of computational platforms**
- **Provides hands on experience in high performance computing**
- **Infuses research experiences into ug education**



Impact of the HPCSI

- **Exposes participants to a full range of research activities**
 - **defining the research project**
 - **researching the subject matter**
 - **experimentation and validation**
 - **documentation of the project**
 - **presentations**
 - **paper submissions to conferences & journals**



Intended Outcomes of the HPCSI

- **Introduce ug students to the joys, rigor, and demands of SEM research**
- **Build a foundation for graduate study and the research involved in graduate study**
- **Prepare students to seize professional opportunities including employment and/or participation in regional and national SEM related conferences**



Sample Titles of Research Pursued by Undergraduate Students During the Summers of 1997 & 1998

- **Modeling of Flow Separation around Single and Arrayed Bluff Bodies**
- **Determining Lithology Using an Information Processing Model**
- **Finite Element Analysis of Liquid Storage Tanks: A Parametric Study**
- **Simulation of Solid State Ultraviolet Photodetectors for Earth Observing Instruments**



Extension of the MSU HPCSI Model to other HBCUs/MIs

- Involve others HBCUs, HSIs, and Tribal Colleges
- The other HBCU/MI student participation model
- The other HBCU/MI faculty and student model
 - allows for student research to continue when they return to their home institution
 - Enable faculty to engage in research employing high performance computing technologies to complement experimentation and theory



Extension of the MSU HPCSI Model con't.

- **The MSU HPCSI Model holds the potential for future sharing of scarce resources and to foster cross-cultural & collaborative experiences**
 - **MSU Cray J-90 & Visualization Software**
 - **Distributed modeling and simulation using the MU-SPIN network**
 - **Teaching courses across MU-SPIN member institutions**



Summary of Program Achievements

- **In excess of eighty (80) ug students have participated in HPCSI in the past five years**
- **33% of HPCSI graduating participants have entered graduate studies**
- **50% of the 1998 participants are now engaged in research during this academic year**
- **15 students have presented at national or regional research conferences**



Summary of Program Achievements con,t.

- **Has resulted in 1 faculty supported research project each year since its third year**
- **Has led to the funding of other Research**



Further Information

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